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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/664,883

09/22/2003

Tatsuhiro Fukuzawa

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EXAMINER

HODGE, ROBERT W

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/664,883	Applicant(s) FUKUZAWA ET AL.	
	Examiner Robert Hodge	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments, see Remarks, filed 9/24/07, with respect to the prior art rejection have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. Patent No. 5,411,818.

With respect to the rejection of claims 8 and 13 applicants arguments are only persuasive regarding claim 13, no amendment has been made to claim 8 to alleviate the lack of antecedence and therefore the rejection will be maintained.

The Examiner notes that the amendment filed 9/24/07 is not completely compliant, applicants amended claim 13 and added an entire paragraph to the end of the claim that was not presented in the claims filed 5/23/07 and did not underline a single word of the added paragraph to claim 13. For purposes of furthering prosecution the Examiner is not sending out a notice of non-compliant amendment but instead is informing applicants of this omission as it appears to be inadvertent, however future omissions of the same or similar degree will invoke the mailing of a notice of non-compliant amendment.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "the laminated sheet" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 5, 6, 11, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,411,818 hereinafter Barlow in view of U.S. Pre-Grant Publication No. 2003/0129495 hereinafter Yamamoto.

As seen in figure 2B Barlow teaches a stacked battery comprising an electrode stack body 12 formed by stacking a sheet electrode 14 and 18, an electrolyte layer 16 and a single layered collector 20, that is bipolar, with the electrolyte 16 being sandwiched between the electrodes 14 and 18, a packaging material housing the electrode stacked body (seals 21 and 24), having an opening which faces the stacking direction exposing a center surface of the collector 20, which is a surface perpendicular to the stacking direction, wherein the electrodes are placed on outermost layers of the electrodes stacked body in such a manner so that the single layered collectors are exposed through the opening and thus function as terminals, wherein the packaging material and the outermost collectors together form the housing and the collectors form

a substantial portion of the housing facing the stacking direction of the electrode stacked body (see also column 3, line 28 – column 4, line 49). Barlow further teaches that it is well known for batteries to be connected in either series, which inherently requires the batteries to be in electrical contact with each other, or parallel, which inherently requires collecting plates arranged on both sides of the batteries in order for them to be properly connected in parallel, and by connecting the batteries in series or parallel, it would inherently require a plurality of batteries for them to be connected either in series or parallel (column 1, lines 13-16).

Barlow does not teach that the shapes of the current collectors or the openings are approximately rectangular.

Yamamoto teaches that the shapes of secondary batteries are not critical to its operation and that batteries may be of any number of shapes (see paragraph [0055]).

At the time of the invention it would have been obvious to one having ordinary skill in the art to form the battery of Barlow such that the collectors and the opening provided for access to the collectors would be rectangular as taught by Yamamoto to provide a battery that would be the proper shape for its intended application and also because it has been held that a change in shape is generally recognized as being within the level of ordinary skill in the art. In re Dailey 149 USPQ 47, 50 (CCPA 1966). See also Glue Co. v. Upton 97 US 3,24 (USSC 1878).

Claims 2, 3, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barlow in view of Yamamoto as applied to claims 1 and 13 above and further in view of U.S. Patent No. 5,254,415 hereinafter Williams.

Barlow as modified by Yamamoto does not teach the specific chemistry as outlined in claims 2 and 3 or hermetically sealing the battery.

Williams teaches a stacked battery comprising an electrode stacked body formed by stacking sheet bipolar electrodes and an electrolyte layer, wherein the electrodes include a collector and the electrolyte is placed between the electrodes, a packaging material housing the electrode stacked body having openings located at opposite ends of the stack which exposes a planar surface of the current collectors (positive and negative respectively at each end), such that the current collectors function as terminals, wherein the positive electrode active material layer is a composite oxide of lithium and a transition metal and the negative electrode active material includes carbon and the composite oxide of lithium and transition metal, which renders the battery a secondary lithium-ion battery and the stacked battery is connected in series such that when stacked the negative current collector of one battery will contact the positive current collector of another battery and everything is hermetically sealed (see figure 1, column 3, lines 24-67 and column 4, line 47 – column 7, line 31).

At the time of the invention it would have been obvious to one having ordinary skill in the art to provide a battery having the structure of Barlow as modified by Yamamoto with the lithium-ion chemistry such as is taught by Williams in order to provide a battery that has improved chemistry that will have a longer cycle life and higher energy density. It further would have been obvious to hermetically seal the battery of Barlow as modified by Yamamoto and Williams as taught by Williams in order

to prevent the electrolyte from leaking out of the battery which would in turn render the battery useless, thereby increasing the overall life of the battery.

Claims 4, 7, 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barlow in view of Yamamoto as applied to claim 1 above, and further in view of JP-2002-075455 hereinafter Uchino.

Barlow as modified by Yamamoto does not teach that the electrolyte layer is a solid polymer, a vehicle comprising the stacked battery or the use of two laminate sheets for the packaging material.

Uchino teaches a stacked lithium ion secondary battery comprising sheet electrodes including a collector and a polymer electrolyte positioned between the electrodes which are located on the outermost layers in such a manner so that the collectors are exposed to the outside and function as terminals, wherein said stacked lithium ion secondary battery is a plurality of batteries connected in series and said stacked battery is used in a vehicle (abstract, paragraphs [0002] and [0007]-[0011]). Uchino further teaches the multiple laminate sheets (paragraph [0011]).

At the time of the invention it would have been obvious to one having ordinary skill in the art to include a solid polymer electrolyte and laminating sheets in Barlow as modified by Yamamoto as taught by Uchino in order to provide a battery with improved efficiency that is easily assembled through lamination. It would have also been obvious to provide the Williams battery in a vehicle as taught by Uchino to provide a vehicle that does not pollute by replacing the internal combustion engine with an electric motor and battery.

Claims 8, 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barlow in view of Yamamoto as applied to claims 1 and 13 above and further in view of U.S. Patent No. 5,618,641 hereinafter Arias.

Barlow as modified by Yamamoto does not teach a sealing resin used around an edge of the opening.

Arias teaches the importance of sealing the openings of bipolar batteries with elastomeric edge seals (column 7, lines 34 et seq.)

At the time of the invention it would have been obvious to one having ordinary skill in the art to seal around the openings of Barlow as modified by Yamamoto in order to prevent gases such as hydrogen from escaping the battery thus causing an explosion hazard and also to prevent anything from the external environment from entering the battery, which could cause a short circuit or severely reduce the life of the battery such as moisture.

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barlow in view of Yamamoto as applied to claims 1 and 13 above, and further in view of U.S. Patent No. 5,378,557 hereinafter Murata.

Barlow as modified by Yamamoto does not teach the thickness of the collectors.

Murata teaches a battery wherein the thickness of the current collector is tens of microns (column 1, lines 19-24).

At the time of the invention it would have been obvious to one having ordinary skill in the art to include a very thin current collector such as on the scale of tens of microns in Barlow as modified by Yamamoto as taught by Murata in order to provide a



battery that is thinner and will not take up as much space so that more batteries can be used to provide the desired output required for the application.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Hodge whose telephone number is (571) 272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RWH

  
JONATHAN CREPEAU  
PRIMARY EXAMINER